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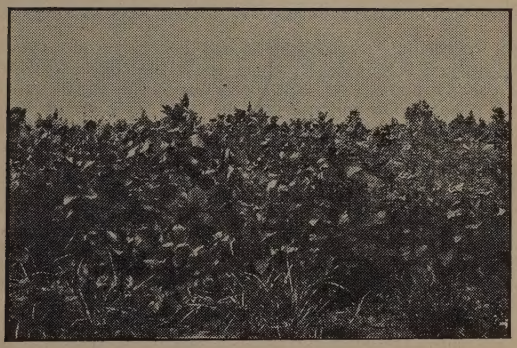
SOYBEAN HARVESTERS

W. F. PATE



A fine growth of soybeans in rows three feet apart

N. C. State College of Agriculture and Engineering
N. C. State Department of Agriculture
N. C. Agricultural Experiment Station, and
U. S. Department of Agriculture, Coöperating

Agricultural Extension Service

B. W. KILGORE, *Director*
Raleigh and West Raleigh

SOYBEAN HARVESTERS

By W. F. Pate

Agronomist in Soil Fertility

During the past few years the growth of soybeans in North Carolina for hay, pasturage, soil improving and seed purposes has increased rapidly. This has been true because of their high food and fertilizing value; the ease with which they could be used in the rotations practiced in North Carolina; the favorable climatic and soil conditions found throughout the State; and the great demand for seed for planting purposes in areas where the crop had not been grown before. One of the first problems to be worked on after soybean growing had been well established was that of devising and manufacturing machines suitable for harvesting the seed cheaply and rapidly.

During the past two or three years the beans have been crushed by many cotton seed oil mills for oil and for meal, and during the past year soybean flour has been placed on the market.

The price of soybeans has ranged from $1 to $5 per bushel, but from $2 to $3 is considered ordinarily a fairly satisfactory price by growers.

Because of the wide interest in the crop, there has been a great demand upon the Division of Agronomy for information with reference to machines suitable for harvesting the beans. This circular has been prepared to supply this demand.

Methods of Harvesting

In harvesting soybeans, two methods are generally practiced in North Carolina. One method is to cut the vines when the lower leaves are yellow and the beans are just about ripe, and then cure in the swath and cocks as is done with cowpea hay. The cutting may be done with an ordinary mowing machine, self-rake reaper, or with a binder, where the plants are tall enough. When the plants are dry, the seed may be thrashed out with an ordinary grain thrasher after the speed of the cylinders has been reduced by using larger pulleys on the cylinder shaft and by taking out a part of the cylinder and concave teeth. With these adjustments only a very small per cent of the beans, if any, will be split.

The other method of harvesting commonly used is by the use of special bean harvesters, which thrash the beans from the vines as they stand in the field. This latter method is coming more and more into common use, especially in communities where there are no reapers and binders. At least six different manufacturers are putting out soybean harvesters, the main feature of all being the beater, which thrashes the beans from standing stalks in the field. The machines are drawn astride the row by two mules or horses and are operated by two men, leaving the stalks, stems, leaves and hulls on the land for improvement of the soil. The beaters of the different machines have a different number of fingers. In some, the beaters revolve parallel to the row, while in others they do so at right angles to the row.

In the manufacture of some of the harvesters, mowing machine wheels are used, while with others the harvesters are mounted on ordinary cart-wheels; with some of the machines, the beater is chain-driven, while in others gears are used. Two of the machines have been on the market for many years. The others have been offered for sale for the first time during the past two or three years. Some are adjustible from the axle and tongue. This feature of the harvesters is still open to improvement, especially when the beans are grown on terraced land and where the beans make a very uneven growth. Some of the machines are made with different width bodies, as in some sections beans are sown in different width rows from that in common practice in other sections. The method of cleaning and sacking while harvesting is still far from perfect with the harvesters as they are now being made.

Following are shown cuts of the harvesters manufactured in the State, as well as some other machines that are used in harvesting the beans at the present time. Each of the machines, as at present constructed, requires two horses and two men to operate it successfully.

Gordon Harvester

This machine is made by L. S. Gordon, Elizabeth City, N. C., and sells for $125.

FIG. 1. Gordon Harvester in action. This machine weights about 800 pounds. The length of the body is 12 feet and width 22 inches. The width of the whole machine from center tread to center is 42 inches. The beater consists of 14 fingers which revolve parallel to the row. It is chain driven. The machine can be raised and lowered from tongue and axle.

Pritchard Harvester

This machine is made by George E. Pritchard, Elizabeth City, N. C., and sells for $150.

FIG. 2. The Pritchard Harvester at work. This machine weighs about 1,140 pounds. The body is 10 feet long and is made in three widths: 32 inches, 48 inches, and 44 inches. Each size has a different width tread as follows: 46, 52 and 58 inches. The body can be raised or lowered from both axle and tongue. The beater is chain driven and revolves at right angles to the row. With this machine the passage for the stalks extends clear to the rear end of the machine.

Little Giant Machine

This harvester is manufactured at LaGrange, N. C., by Hardy & Newsom and sells for $150.

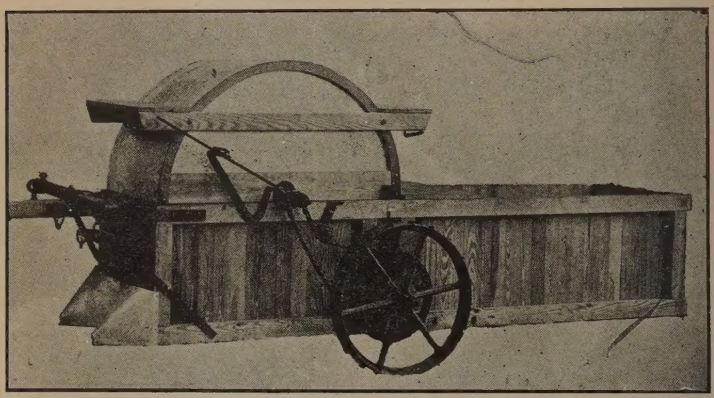


FIG. 3. The Little Giant Machine ready for use. This machine weighs about 850 pounds, and the body is 11 feet long and 30 inches wide. From center tread to center is 39 inches. The machine can be raised or lowered both from axle and tongue. The beater has 35 spike-like teeth and is chain driven. The wheels and axles are the same as those used on a mowing machine.

Pasquotank Harvester

This machine is manufactured at Elizabeth City, N. C., by the Pasquotank Peapicker Company and sells for $170.

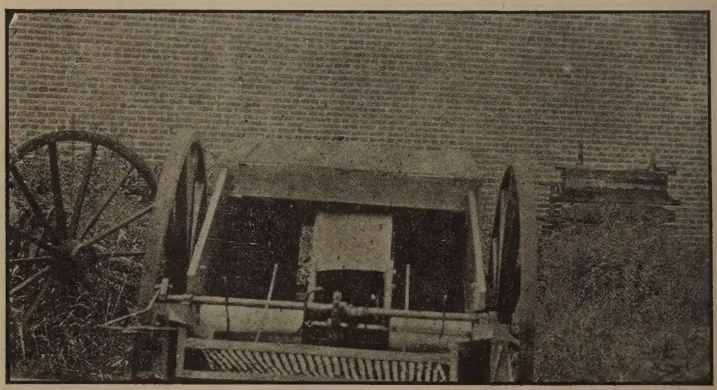


Fig. 4. Showing the working parts of the Pasquotank machine. This machine weighs about 800 pounds, and the body is 8 feet long and 40 inches wide. It can be raised and lowered from axle and tongue. The beater is driven by chains and gears, and has 8 fingers on the cylinder, which makes about 400 revolutions per minute. On the rear of the machine there is a screening device with bin below of six bushels capacity.

Taylor Harvester

This machine is made by I. E. Taylor, Chocowinity, N. C., and sells for $150.

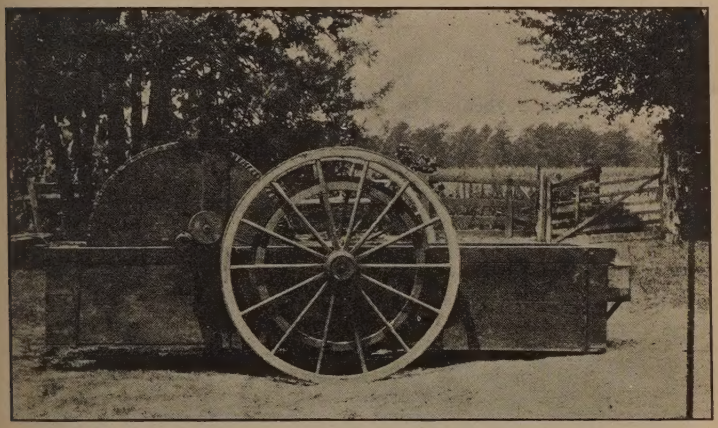


FIG. 5. Side view of Taylor Harvester. This machine weighs about 500 pounds. The length of the body is 12 feet and tongue 9 feet long. The inside width of the body is 22 inches. From center tread to center is 46 inches. The beater consists of sixteen fingers which revolve parallel to the row. It is chain driven. This machine is put out in three sizes.

Harvesting Soybeans With a Reaper

FIG. 6. Harvesting soybeans with a grain reaper.

Thrashing Soybeans That Have Been Cut With a Reaper

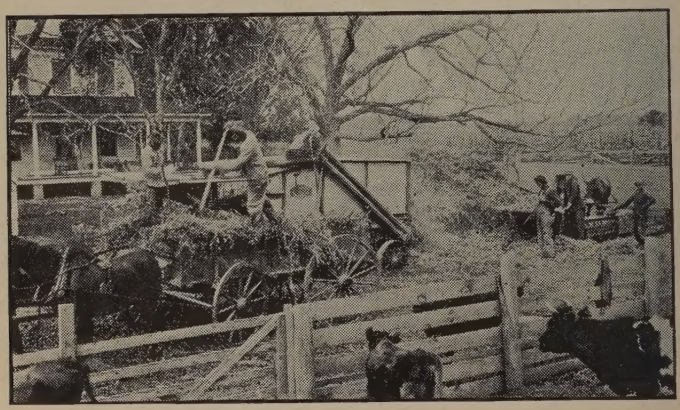


FIG. 7. Thrashing soybeans that have been cut with a reaper.

Tar Heel Harvester

This harvester is made at Farmville, N. C., by the Carolina Manufacturing Company and sells at the present for $150.

The Tarheel Harvester weighs about 675 pounds, and the body is 9 feet 8 inches long and 24 inches wide. This machine can be raised or lowered from the tongue. The beater has 14 fingers arranged on a cylinder, which makes about 225 revolutions per minute. It is driven by gears. The wheels and axles are the same as are those used on a mowing machine.

Useful Information About Harvesters

On the following pages is given much useful information concerning soybean harvesters.

Name of manufacturer	Pasquotank Peapicker Co.	Carolina Manufacturing Co.	George E. Pritchard.
Address	Elizabeth City, N. C.	Farmville, N. C.	604 N. Rood Street, Elizabeth City, N. C.
Name of harvester	Pasquotank	Tarheel	Pritchard.
Price of harvester, 1918	$170	About $150	$150.
Weight of harvester	800 pounds	675 pounds	1,140 pounds.
Length of harvester	Body 8 feet	9 feet, 8 inches	10 feet with tongue off.
Width of body or box	40 inches	2 feet	32-in. size, 38-in. size, 44-in. size.
Width (center tread to center)	44 inches	46 inches	Track, 46 in., 52 in., 58 in.
Kind of wheel used	Wood, iron hub	Mowing machine	Hackney cart, 2 in. tread, 60 in. high.
Can harvester be raised or lowered from axle?	Yes	No	With adjustment.
Can harvester be raised or lowered from tongue?	Yes	Yes	Yes.
How is beater driven, with gears or with chains?	Chains to center shaft then by gears	With gears	Gear from drive wheels with chain down to socket on gear shaft.
Number of revolutions made per minute by beater?	428	300	Two per foot.
Number of fingers on beater?	Eight	14	Six.
Does beater revolve parallel to row?	Yes	Yes	No.
Does beater revolve at right angles to row?		No	Yes.
How many inches can harvester be lowered?	8 inches	4 or 5 inches	From flat to ridge cultivation 12 in. high.
Can it be adjusted while in motion?	No	No	No.
How many bushels of beans will box hold before sacking?	Sacks beans while in motion; capacity 6 to 9 bu. an hour	About 5 bushels	4 to 8 bushels.
How many beans can be harvested by the hour?		Would depend on beans	15 to 20 bushels.
What per cent of beans will the harvester harvest?	90 per cent	80	75 to 95.
Will harvester do good work on level cultivation?	Yes	Yes	Yes.
On ridge cultivation?	Yes	If not over 5 inches high	Yes.
Will harvester harvest beans planted between four-foot rows of corn?	Can be arranged to do so	Yes	No.
Does harvester have a screening attachment?	Yes	Yes	
Bagging attachment?	Yes	No	
How many hands does it take to operate your harvester?	One	Two	1 to 4.
How many horses?	Two	Two	Two medium-sized 850 lbs.
What is the minimum width of rows the harvester will work in?		From three feet up	3, 3 1-2 and 4 feet.
Will your harvester harvest cowpeas?	No	If planted in rows and standing up	No, not successful.
If so, what varieties have you tried it on?		Unknown peas	
How many sizes of harvesters do you make?	One	One	Three.
How many harvesters will you be able to make this year?	100	25	Don't know.

Name of manufacturer	L. S. Gordon	Hardy & Newsom	I. E. Taylor.
Address	Elizabeth City, N. C.	LaGrange, N. C.	Chocowinity, N. C.
Name of harvester	Gordon	Little Giant	I. E. Taylor.
Price of harvester, 1918	$125	$150	$150.
Weight of harvester	800 pounds	850 pounds	500 lbs.
Length of harvester	12 feet	Eleven feet	Body 12 feet, tongue 9 feet.
Width of body or box	33 inches	26 1-2 in. inside, 30 in. outside	22 in. inside.
Width (center tread to center)	42 inches	39 inches	46 inches.
Kind of wheel used	Hackney Standard, 5 ft. high, 3-in. tread	Mowing machine	Cart wheel 2 in. tire.
Can harvester be raised or lowered from axle?	Yes	Yes	Yes.
How many inches can be lowered?	Yes	Eight inches	Four inches.
Can it be adjusted while in motion?		No	No.
How is beater driven, with chains or with gears?		Chains	Chains.
Number of revolutions made per minute by beater?	Fourteen	One revolution per foot	
Number of fingers on beater?	Yes	10	Sixteen.
Does beater revolve parallel to row?	No	Yes	Yes.
Can harvester be raised or lowered from tongue?	Ten inches	Yes	Yes.
Does beater revolve at right angles to row?	No	No	No.
How many bushels of beans will box hold before sacking?	Eight bushels	20	
How many beans can be harvested by the hour?	Twenty bushels	20 bushels	Ten bushels.
What per cent of beans will the harvester harvest?	90	Guarantee 75 per cent	85 per cent.
Will harvester do good work on level cultivation?	Fair ridge far better	Yes	Yes.
On ridge cultivation?	Yes	Yes	Yes.
Will harvester harvest beans planted between four-foot rows of corn?		Cannot harvest a row of beans in middle of 4-foot row; rows should be 5 or 5 1-2 feet	No.
Does harvester have a screening attachment?	No	No	No.
Bagging attachment?	No	No	No.
How many hands does it take to operate your harvester?	Two	Two	Two.
How many horses?	Two	Two	Two.
What is the minimum width of rows the harvester will work in?	36 inches	5 feet, but 5 1-2 feet is better	5 to 6 feet.
Will your harvester harvest cowpeas?	It has been done	No	No.
If so, what varieties have you tried it on?			
How many sizes of harvesters do you make?	One	One	16 ft., 22 ft., and 24 ft.
How many harvesters will you probably make this year?		500	Fifteen.